5-10-2019

TrailXplorer: An interactive mobile educational tool to promote safety awareness and prevent injuries from outdoor adventures.

Zhuoxin Xu
zxx5960@rit.edu

TrailXplorer

An interactive mobile educational tool to promote safety awareness and prevent injuries from outdoor adventures.

Zhuoxin Xu

A Thesis Submitted in Partial Fulfillment of the Requirements

for the Degree of Master of Fine Arts in Visual Communication Design

School of Design

College of Imaging Arts and Sciences

Visual Communication Design

Rochester Institute of Technology

Rochester, NY

May 10, 2019

Thesis Committee Approval

Chief Advisor

Mike Strobert, School of Design, College of Imaging Arts and Sciences

Signature of Chief Advisor Date

Associate Advisor

Daniel Deluna, School of Design, College of Imaging Arts and Sciences

Signature of Associate Advisor Date

Associate Advisor

Jason Arena, School of Design, College of Imaging Arts and Sciences

Signature of Associate Advisor Date

Table of Contents

Abstract

This thesis seeks to introduce an interactive mobile prototype to promote safety awareness and a visualized guideline to assist outdoor adventurers.

Nature is a place where many people go to find peace and relax. According to the "Outdoor participation report 2017" (the Coleman Company, 2017), 144.4 million Americans participated in outdoor activities in 2017. Unfortunately for a multitude of reasons, people encounter some type of unfortunate event that results in either injury or death. As the number of outdoor participants has continued increased annually, safety awareness and skills training have become increasingly crucial now more than ever. This project sought to not only educate people's outdoor skills and reduce injuries but to also proposes new interactive methods that can support them in the future.

The overall purpose of this project was to reduce injuries from outdoor activities by promoting safety awareness and educate people on outdoor activity skills. By providing users with information about environmental conditions and Augmented reality technology, users can have better insights into their surroundings in addition to knowledge of useful safe solutions when they go outdoors. Therefore, in the future outdoor enthusiasts will be able to enjoy a better and safer adventure. More importantly, this project explored how to integrate emerging technologies into people's real- life experiences while helping them to solve problems.

The deliverables of this project included three parts. Firstly, the user research. A lot of user research methods, such as user questionnaire, interviews, user personas are used to identify the target audience, their needs and pain points. Secondly, the interaction design process included planning and documenting user flow, the definition of design through wireframes and visual design iterations. To find the optimal user experience, scenarios were evaluated based on user objectives. Lastly, a demo video was created to help communicate the workflow by simulating the use cases. This project proposed to combine user experience methods, interfaces design, and augmented reality technology to deliver a better and safer outdoor experience.

Keywords: Educational tool, prevent injuries, interactive application, augmented reality, safety awareness.

Introduction

Situation Analysis

Almost half of the people in the US participate in different outdoor activities every year (the Coleman Company, 2017), about 31% of people encounter some types of unfortunate event that results in either injury or death. Fortunately, according to statistics (the Coleman Company, 2017), 20% of these accidents could have been prevented. To support safer outdoor adventures and reduce outdoor injuries, there are many applications in the market trying to protect outdoor enthusiasts. Such as, texting real-time status on warnings, alerts, security information or providing outdoors details routes, hand-curated trail maps. However, these applications have a problem in that they cannot draw people's attention until they get hurt and they have a hard time to supporting the user in the real-time. Lack of background knowledge, outdoor experience, and poor judgment are the three main reasons that people got injured.

Problem Statement

How may we create a safer and more enjoyable outdoor adventure?

While outdoor activity is a great resource for exercise and entertainment, safety should be a big concern for travelers all the time. Unfortunately for many, it is a low priority until they get hurt. As the amount of outdoor adventures participants has been increasing annually, promoting safety awareness and reducing outdoor injuries have become increasingly more important than they ever before. Interactive applications can play an important role in educating the public on outdoor adventures when they have limited knowledge of the potential risks. Users can also rely on application alerts to inform them of dangerous situations while also supporting greater safety awareness as well.

Augmented Reality (AR) technologies are set to change industries from construction to retail and transform the way we interact with the digital world in everyday life (Matt Adcock, 2018). We should take advantage of AR to guide and support people when they go outdoors as it can give the user better insight into their surroundings and provides users with a visualization of safe solutions – all in real-time. With the AR technology, no matter whether the user is planning a trip or needs a trail guide, or even need an emergency rescue, it can help the user to reduce the potential for risk as they enjoy a safe adventure.

Context

TrailXplorer takes advantage of AR to guide and support people when they go outdoors and providing a better and safer outdoor experience, the implementation of the mobile application sought to achieve following the objectives: greater safety awareness, educate users in outdoor skills, guide and protect users in real-time, and increase the frequency of usage.

To achieve these objectives, four approaches were implemented in this project after a wide range of market research and competitive analysis.

Mobile technology – Easy access to all the information and greater safety awareness

In this project, TrailXplorer chose mobile as its primary platform. This application is primarily used by individuals who are adventurous, instead of creating a new wearable hardware, using a small portable guide device that people already have eases the burden for them in outdoors. Mobile technology also saves the user more space for more essential gear, such as food, water, and clothes. In addition, considering the convenience of checking the GPS or asking help, mobile device is more user-friendly than other tools.

Additionally, smartphone technology, it can dramatically improve the way that people communicate with each other and it diminishes the impact of geographic constraints. With just one click people can instantly learn an infinite amount of information (Richard Munoz, 2018). By browsing the TrailXplorer feed, users can get the latest updates on their future destination which allows the user to be prepared for their trip and greatly enhances the safety awareness. The frequency of mobile notification and instant information dissemination attracts more attention from the user which then increases the chance of people to attach importance to their safety.

Furthermore, choosing an easier and more acceptable way of spreading the safety information is also important. About Ninety percent of people say that smartphones are very important in their life and 61% say that it is even more important than their coffee (Hira Shamim, 2018), which suggests that we can take advantage of high mobile phone usage to convey all the information more effectively.

All kinds of educating methods

After promoting safety awareness, the application needed to enhance the user's outdoor skills. Knowledge and skills training can compensate for lack of experience and poor judgment. Instead of a traditional texted-oriented travel guidebook, TrailXplorer will be a platform that outdoor enthusiasts can communicate with each other while learning the outdoor skills with joy and interest through multimedia - such as training videos, articles, online quizzes, live speeches, and forums. According to research, a benefit of multimedia learning is that it takes advantage of the brain's ability to make connections between verbal and visual representations of content, leading to a deeper understanding, which in turn supports the transfer of learning to other situations (Alina Chioran, 2016). We can take advantage of multimedia learning to helps the user learn easier and faster.

More than that, considering personal preferences, user cases and scenarios, multiple-media learning methods were also important as users can choose their preferred way to learn outdoor skills. However, today's technology has a limitation associated with geographic constraints; the user can have a hard time to connecting to a network in some deserted places, which significantly increases the potentials of risks. TrailXplorer allows the user to preload the training course and contingency plan. No matter whether users are interested in planning before the trip or need support while on the trail, they can learn more about outdoor skills using the application.

Augmented Reality Technology

Using an augmented reality tool to guide and support the user is the most important part of TrailXplorer, and also, it is the biggest part that differentiates it from current products in the market. After user research and competitive analysis, poor judgment was one of the main reasons that people got injured in the outdoors. Most current tools cannot identify the problem in the first place nor provide the user an accurate or appropriate solution, which ultimately lead to worse outcomes. Users are eager to find an efficient tool with real-time tracking to support them while travelling. According to research, AR is now being used by the world leader in GPS navigation technology, allowing a virtual overlay with live cameras in real-time. This new AR feature is not only intuitive, but it's also safer than traditional navigation apps (Tim Hinchliffe, 2017). Real-time tracking and augmented reality technology, it can give the user better insights into their surroundings and dramatically save time. People can quickly understand the solutions through the use of the AR feature as opposed to the literal

guides used in the past. To prevent an injury, the AR feature can be used before the trip, to highlight the difficult levels through an outdoor rating system that can inform the user of potential risks; To guide and protect the user during the trip, AR can give the user real-time navigation and hazard warnings; Once the user encounters some unfortunate event, the application can help that user to quickly identify the problem, provide them with a visualization of first aid solutions, or asking for an emergency rescue.

Attractive and personal content

According to the user research, many users complained that they don't have the motivation to use travel safety applications for a long period of time. The endless text-oriented guides and irrelevant accident reports do not draw their attention. Instead of general travel advice and innumerous recommendations, user preferred more information about their future destination and their personal trail guide. In TrailXplorer, the application helps the user to filter out unrelated results and present the choices that match the users' outdoor skills level and travel preference- the user can find their favorite destination without wasting tons of time. Besides that, the application offers gear evaluation and various outdoor channels that give the user more opportunities to communicate with experts and remain safe during their trip.
Furthermore, while considering the delivery of better user experience, this project also explored various visual languages and styles to meet the aesthetic requirements, subtle amusing motion, and clean visual style in hopes to increase the user's interest and usage frequency.

Design Process and Solution

Define Design Strategy and User Research

The goal of this project is to reduce outdoor injuries by promoting safety awareness and more accessible education on outdoor skills. The design process included User Research, Competitive Analysis Brainstorming and Ideation, Information Architecture, Use Case, Wireframe, Final Design and Prototype, Feedback and Improvement. More details about the design process are seen in the figure 1.

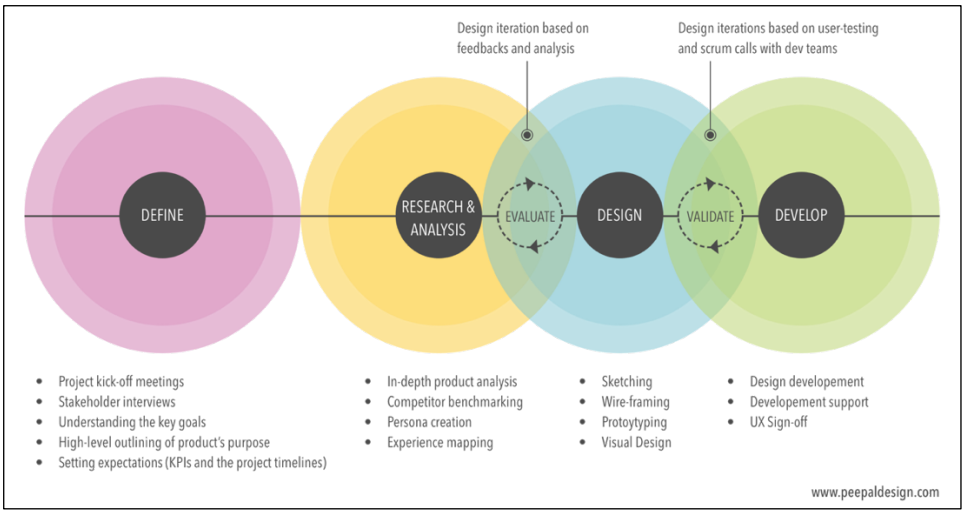


Figure 1. User experience design process

User Research

TrailXplorer targets all outdoor enthusiasts between the ages of 18 to 50 who were willing to learn about outdoor skills and get more travel information. This age group was selected as it is easier for them to figure out the workflow, technologies such as geo-fencing and AR were implemented in this project. Also, this is an active age range who goes outdoors frequently.

A user questionnaire was conducted to help the designer narrow down the design scope and to quickly identify the problem so that we can have a better understanding of the user's pain points and their core needs regarding about outdoor adventures.

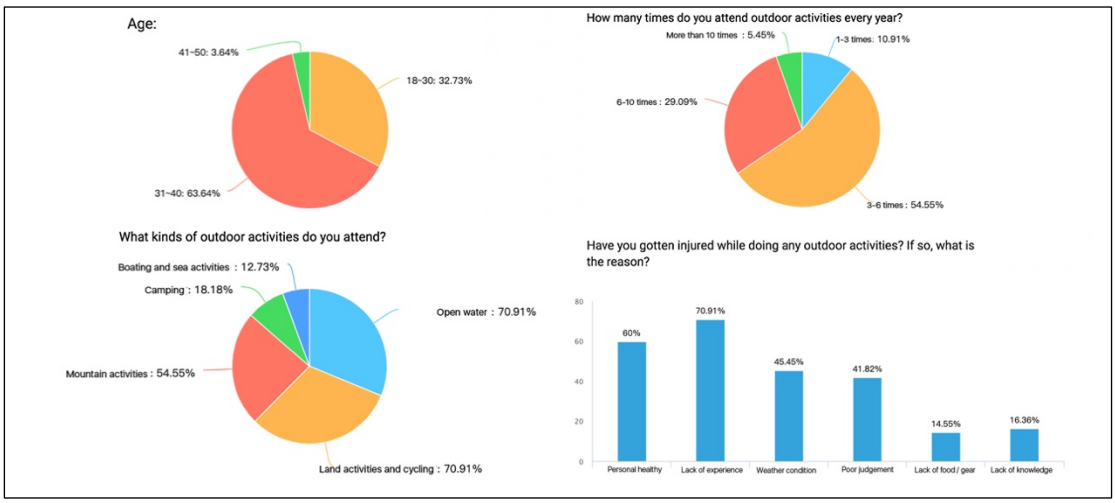


Figure 2. User questionnaire results

Results from the questionnaire indicates that the main target audience ranged in age group from 18-40 (96.36%), and more than 89% of users participated in five or more outdoor activities in the past year. Many participants preferred open water activities, land and cycling activities, and hiking. Moreover, personal health condition, lack of knowledge, lack of experience and poor judgment were identified as the main reasons that people got injured while they are attending outdoor activities. Users were asked. "Which functions interest you the most in an outdoor application?" The answers included life-saving skills (78.6%), route/ activities recommendation (42.9%), equipment evaluation (35.7%), and a personal trail record (14.3%).

Besides the information from the questionnaire, the designer also created several personas based on observing actual users. The real value of a user persona is to list down the goals/motivation of the people who will be using the application. Understanding the users, their motivations, and their requirements helps in building user-centric products (Quovantis, 2018).

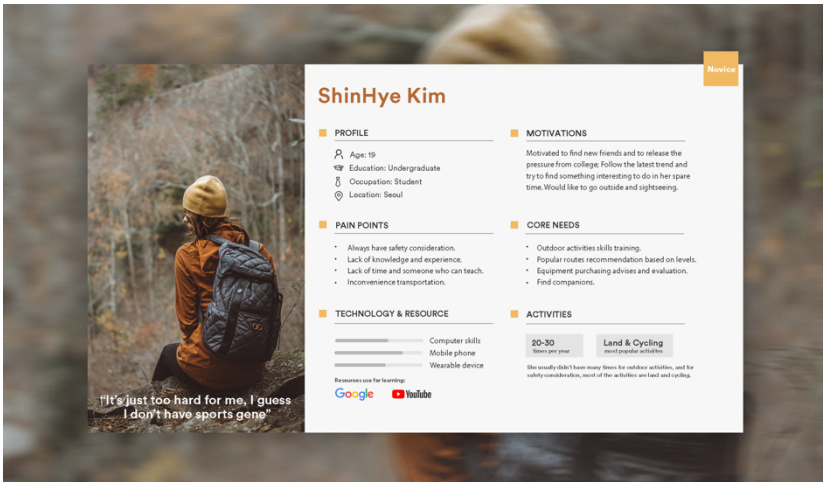


Figure 3. User persona 1- Novice

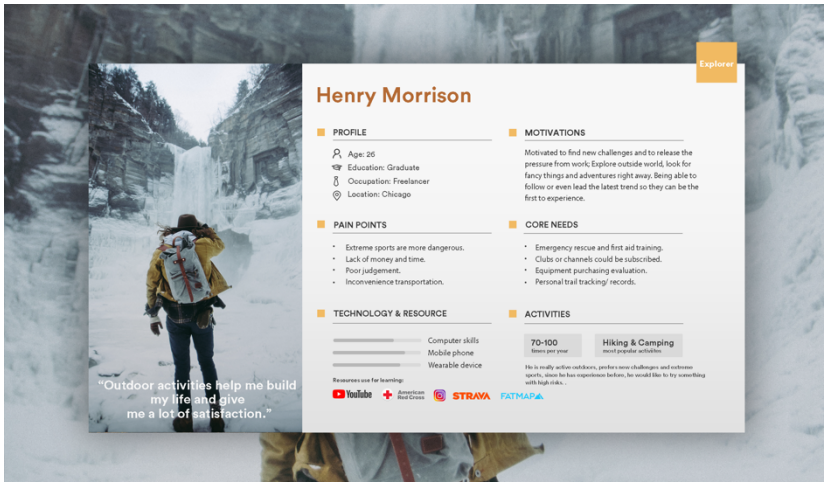


Figure 4. User persona 2- Explorer

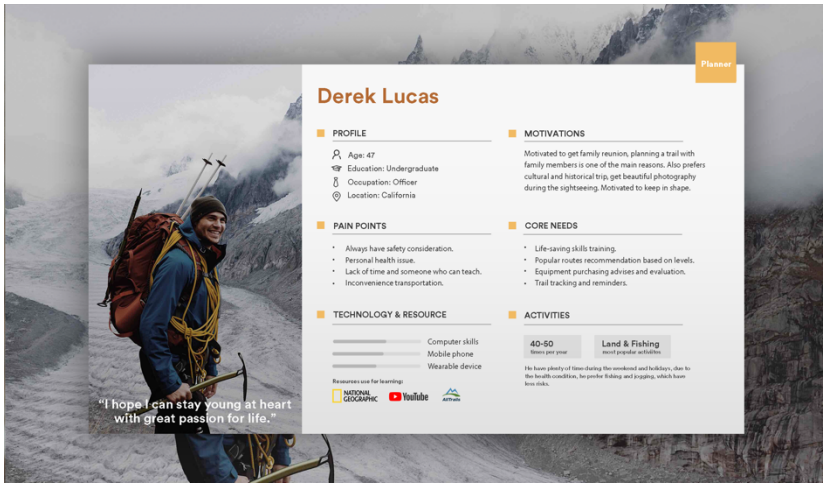


Figure 5. User persona 3 - Planner

In summary, the three personas represent different kinds of users, based on their outdoor skills level. Their core needs are different, for example, a novice wants more route recommendations and trip guides, while explorers prefer personal trail records and equipment evaluation. Elderly people are more like planners, they value life-saving skills more than the others because of their personal health issues. Therefore, it is important that the designer should gather all the information and distinguish through different levels to meet various needs.

Competitive Analysis

Regardless of whether it is Chinese or US marketing, only a few products are providing solutions for the user and supporting them in real-time which means this is the opportunity for the author to dive into it.

Furthermore, most interfaces from current applications in today's market are text-oriented and condensed layout. It's hard for the user to go through every word. TrailXplorer should use a more attractive and engaging presentation method.

Brainstorming and ideation

To deliver better user experience, brainstorming and ideation were conducted. Firstly, all the major related parts of outdoor adventures safety were listed in the figure 6 below. Then integrating new technology into the application and suggesting advanced and futuristic methods to support the user better in the future.

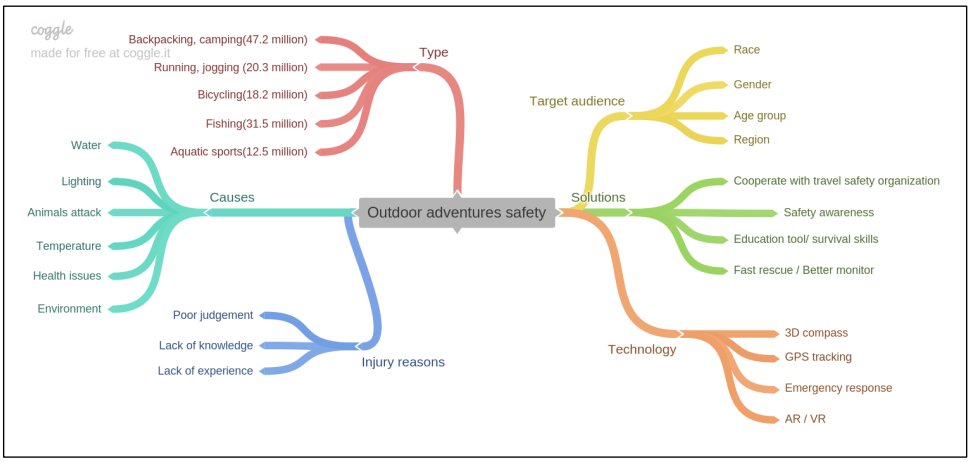


Figure 6. Brainstorming section

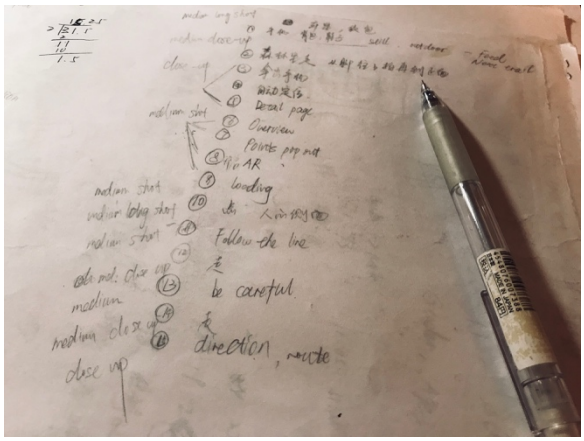


Figure 7. Paper wireframe sketch

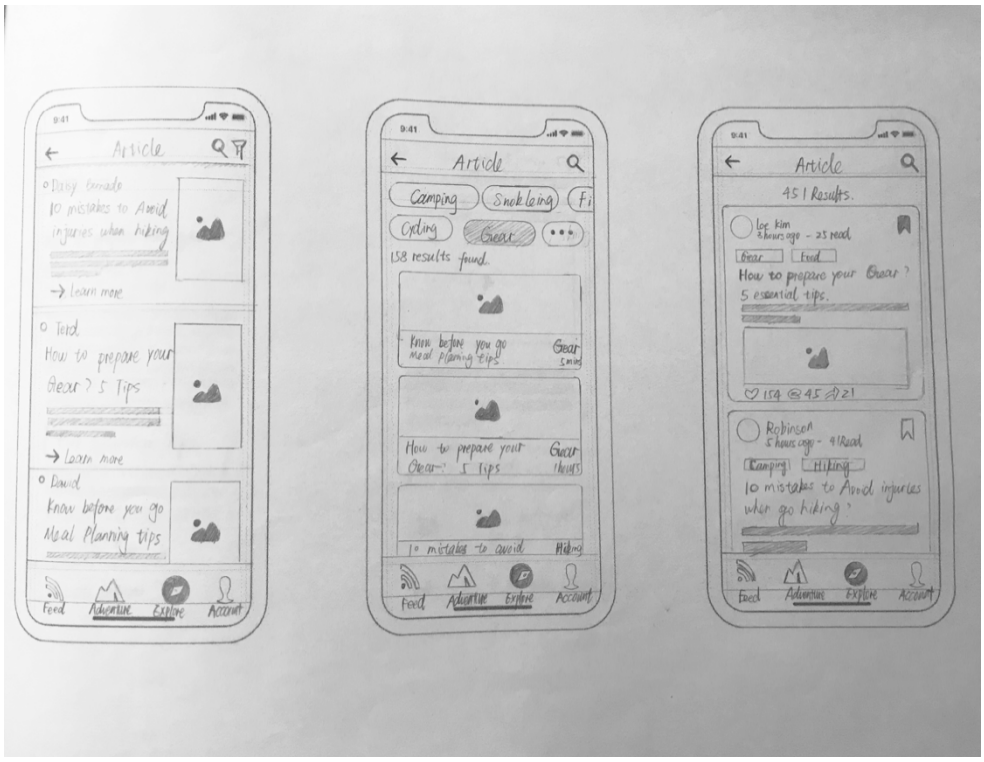


Figure 8. Paper wireframe sketch 2

Aligning with to the goal of reducing injury from outdoor adventures, numerous sketches were drawn for ideation. Each main interface has more than three versions as you can see in the figure 7. Taking the education part as an example, and considering personal preferences and scenarios, multi-media teaching methods were provided that were differentiated in design. For the online articles, as can be seen in the figure 8, the first attempt was a list view that displayed articles like a traditional news application, clearly showing the article title and where a lot of space was saved on the single page. However, it is hard for the user to identify what content is useful for them unless they did enter the next page. We cherished user's time and wanted them to find useful information as soon as possible without browsing tons of irrelevant content. So, in the final design, a list view was abandoned in favor of a card view to present the article as a thumbnail where it not only showed the basic information about the

articles but reflected the categories through tags and the amount of likes and comments. These changes helped the user to make better decisions when they were browsing.

Figure 9. Paper wireframe sketch 3

There were also many different considerations around the key feature, the AR page. What kinds of information were the most important for users and how to display them on the screen? As you can see in the figure 9, both landscape and portrait mode were designed and the initial design was similar to a Google map. it showed the route detail and step by step direction. However, considering both the extreme weather conditions and the body movement, the user was not able to always hold onto the phone all the time. Thus, it is possible and reasonable to just maintain the direction guide, warning message, and some statistics on the screen. In the final version, the screens were kept simple and clean for ease of use. In the meantime, important content was also emphasized.

Develop of Information and Design Ideations

In regarding digital design, information architecture means to divide information into small pieces, labeling and organizing them in a way so that the information can be easily found and effective to use (Stavan Himal, 2018).

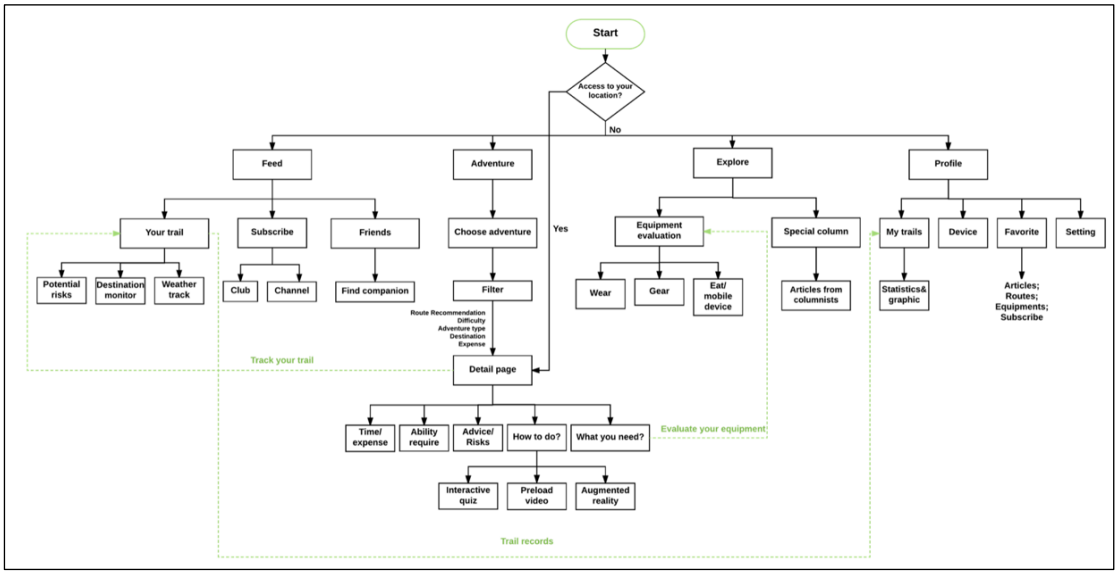


Figure 10. Information architecture of TrailXplorer

This application has four main parts: feed, adventure, explore, and profile. (a) Feed section includes your trail updates, outdoor channels. and friends' post. By browsing the subscribed feed or outdoor channels, users can get the latest updates on their future destination and be better informed and prepared about specific trails. Features like weather forecasting, alerting and accident reporting were also included in this section. Moreover, users would be able to share information with each other, or find companions in this section. (b) The adventure section was a route recommendation based on your outdoor skills level and personal preference, where the user could customize the activity type, cost, and equipment required for their favorite route. All information related to the trip was provided for the user to explore, including expense, duration, potential risks, equipment, skills level, etc. Even the basic skills and teaching course were offered by the platform. If used during the trip, the user could directly link to the activity users were doing and activate the AR mode in the adventure section. (c) The explore section was also another form of educating the user and helping the user to be better prepared for their trip. This section included the gear evaluation and the outdoor forum which encourages the user to

learn more from the professional experts before they start the trip. (d) The last part is the profile section. In this section, users can find their trail records, personal information, and settings.

Figure 11. Mid High-Fidelity Wireframes

Based on the initial design concept, the author made some improvements and chose the style and pattern for final design, the final version is not only the best approach to follow the logic work flow, but also trying to deliver a better visual aesthetic to the user.

Use case

Two use cases were created to indicate different scenarios, we want TrailXplorer to be an effective tool to learn the outdoor skills, regardless if users are interested in planning before the trip or need support on the trail, they can find a useful method to learn the skills. After each use case, the relevant interfaces were inserted to support the use case. The primary use case was “How can AR be used to educate people in real-time? The first step is to open the application, then rely on the real-time tracking technology where the application helps find the user’s location and show the detailed information on the trip. After that, the user can use the AR mode in real-time. To prevent the injury, prior to the trip commencing the AR feature highlights the difficult levels through an outdoor rating system that is used to inform the user of the potential risks; For example, during the trip, AR gives the user a real-time navigation and hazard

warning; If the user encounters some unfortunate event, the application can help the user to quickly identify the problem and provide the user with a visualization of first aid solutions.

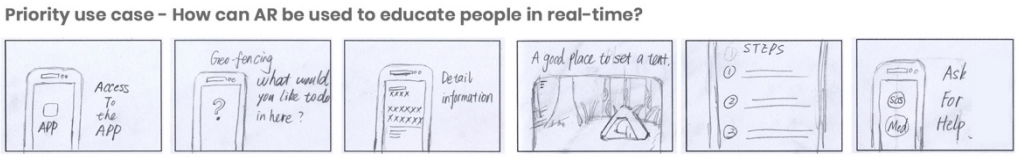


Figure 12. Primary use case

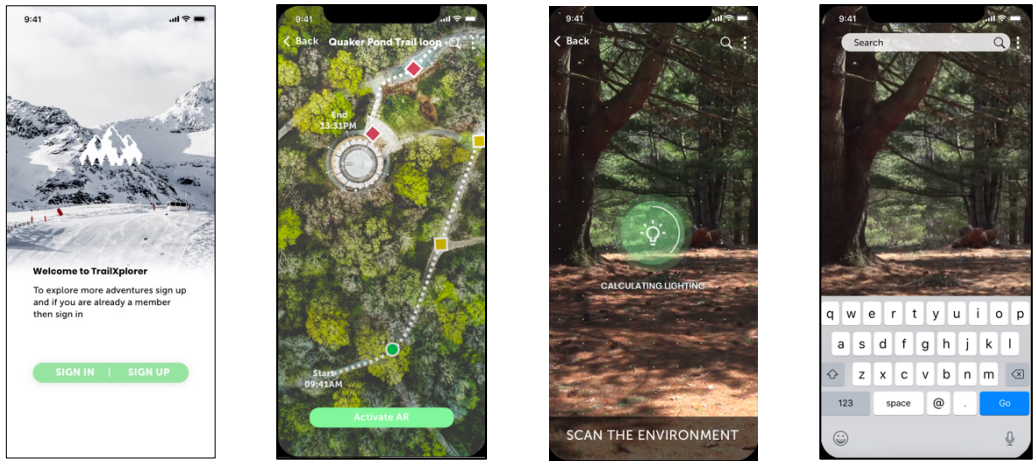


Figure 13. Primary use case interfaces

The secondary use case was “How can TrailXplorer be used as a pre-learn tool to educate people at home? The first step is to open the application, then they can browse the activity page to choose their favorite route, they can either access the route result page from quick icons or search the keywords directly. After viewing the result list, users can enter the detailed trip page and explore more information about the specific trip. Additionally, users can also learn the outdoor skills in the other sections within this application.

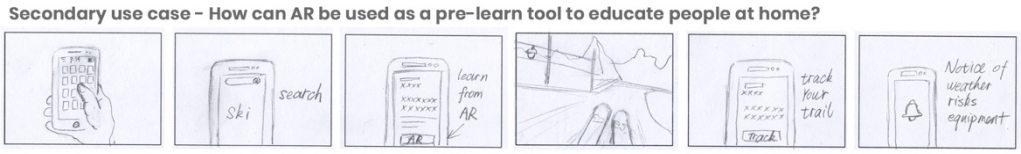


Figure 14. Secondary use case

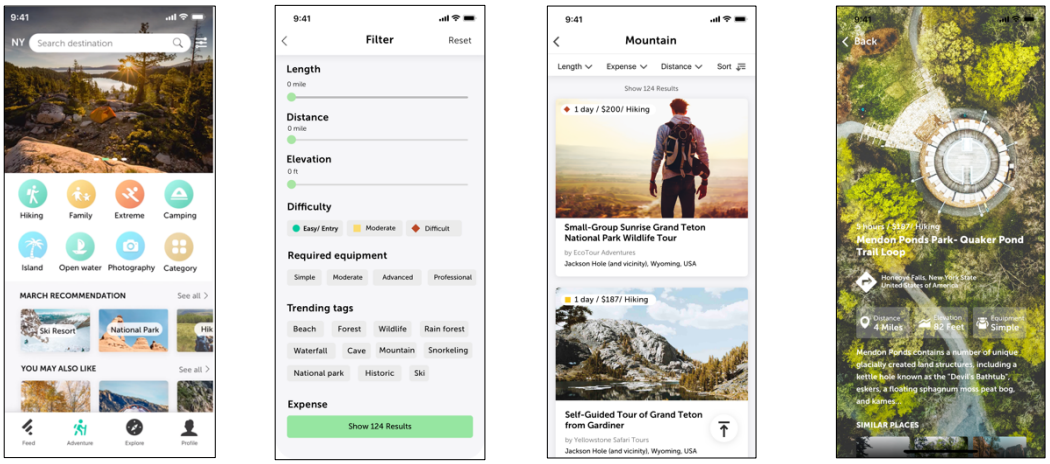


Figure 15. Secondary use case interfaces

Final Design Result

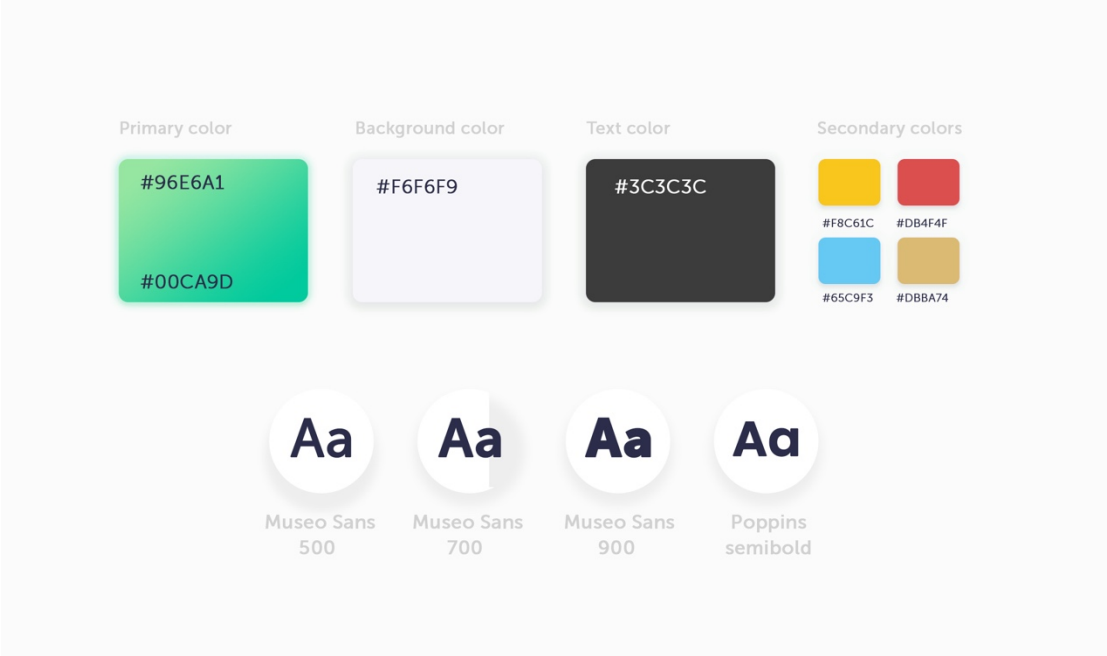


Figure 16. Color study and typeface

To create an active and energetic feeling, light and soft color were chosen for the interface.

Green, as the primary color, represents nature, safety, reliability and hope, which matches the goal of this application, to reduce injuries. Since the application has a lot of pictures content, a simple and clean background was needed, and instead of using the pure black color as text color, dark grey was chosen to show less rigid feeling. The secondary colors were using the triadic palette. Triadic palettes consist of three main colors equally spaced on the wheel, which makes for a diverse palette (Luke Clum, 2018). The contrasting colors here are softened with tints which created a neutral tone and showed the diversity as well.

Font choices often set the tone for the whole design and can influence viewers' feelings toward and interactions with your design (Janie Kliever, 2018). After choosing from the whole alternative list, Museo Sans family was used as my application font and Poppins as display and presentation font. Compared to the Apple official font San Francisco UI Text, Museo Sans font was chosen for the reason of energetic.

The overall design style builds a professional and attractive interface which allows the app to be approachable and easy to use.

Detailed features

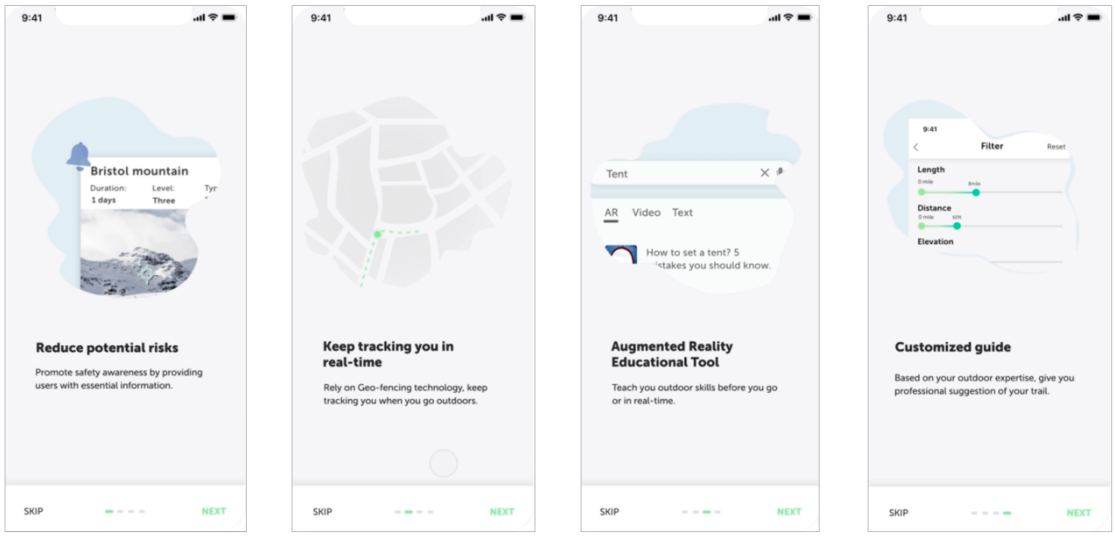


Figure 17-20. Onboarding pages

Onboarding pages were designed to explain the core value and the functionality of the application, so users can get an immediate sense of what the application is about at first glance. There were four onboarding pages to introduce TrailXplorer.

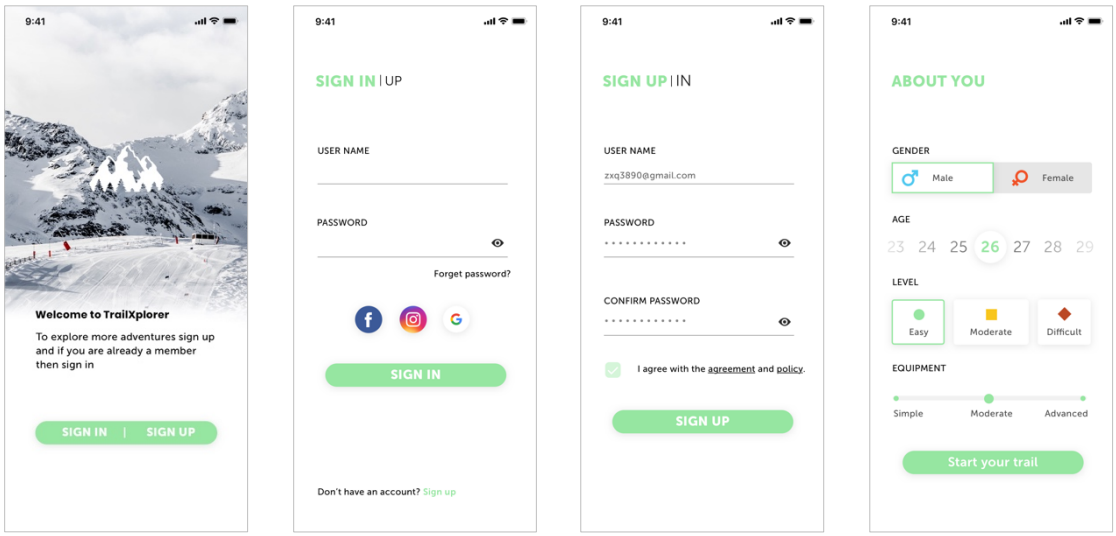


Figure 21-24. Sign in/ up pages

These are the sign up/in and about pages of TrailXplorer, “About page” was designed to gather basic information from users. So, the application can recommend different routes based on user’s skills level.

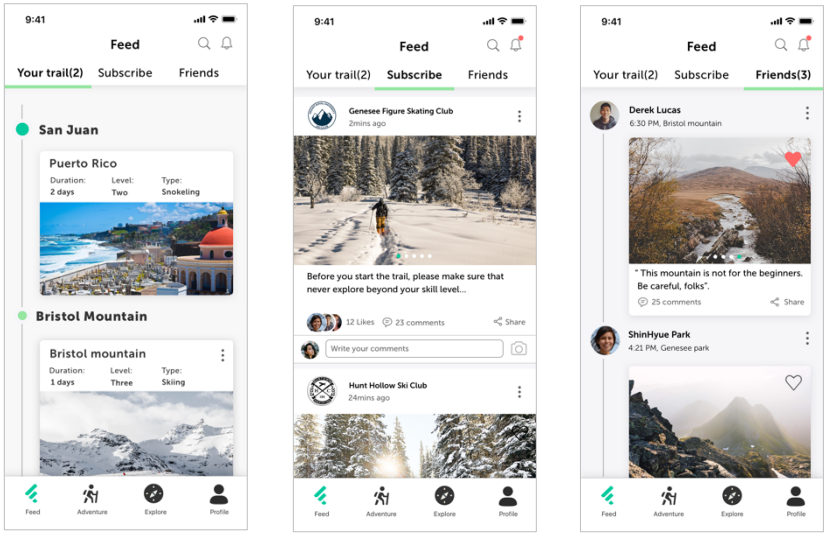


Figure 25-27. Feed features (Personal information, subscribe, friends)

By browsing feed, users can get the latest updates of their future destination, there are three sections in feed, personal trip tracking, information like weather forecasting, alerting and accident reporting were displayed in here which allows the user to be prepared for their trip and greater the safety awareness. The subscribe section was designed to follow the clubs and channels news, and the friend section was like the social media post to see friends' activities.

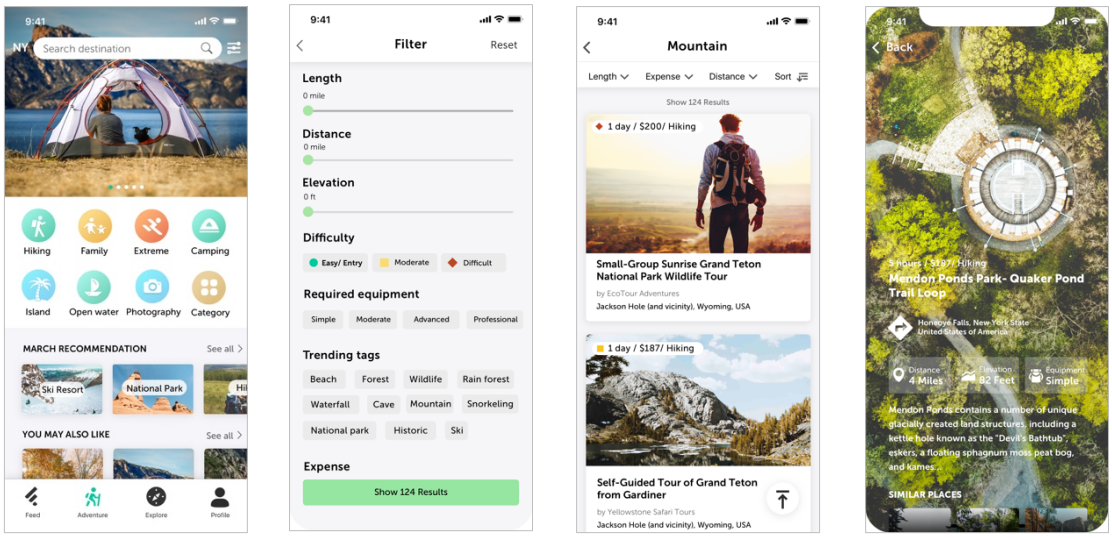


Figure 28-31. Homepage, filter, results and detail page

This is the homepage of TrailXplorer, included quick entries and recommendation, the filter is in the right corner which allows users to customize their future destination. In the detail page, all the information around the trip would be displayed to let the user to browse.

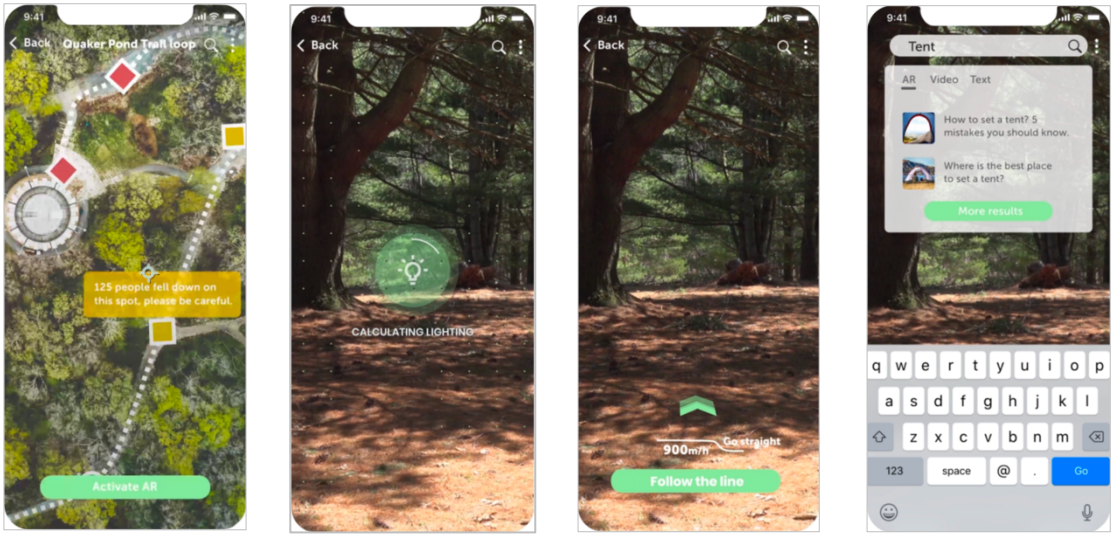


Figure 32-35. Augmented Reality and real-time tracking

When the user activated the AR mode, the instructions were displayed on the screen. This feature gives user better insights of surroundings and the user can have quickly understanding of the solutions.

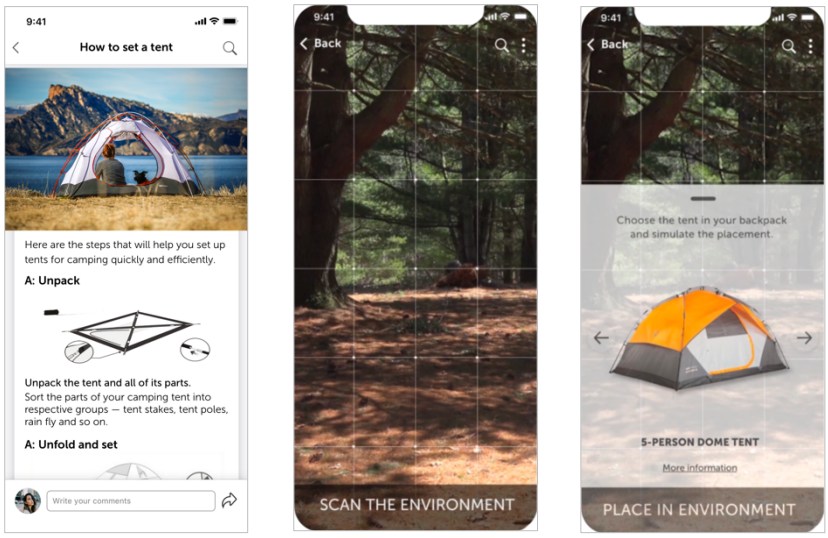


Figure 36-38. Augmented Reality features

Besides guiding system, the application also allows the user to search the information they need during the trip, like pitching a tent, users can either follow the text-based instruction or see the step by step interaction-based guiding.

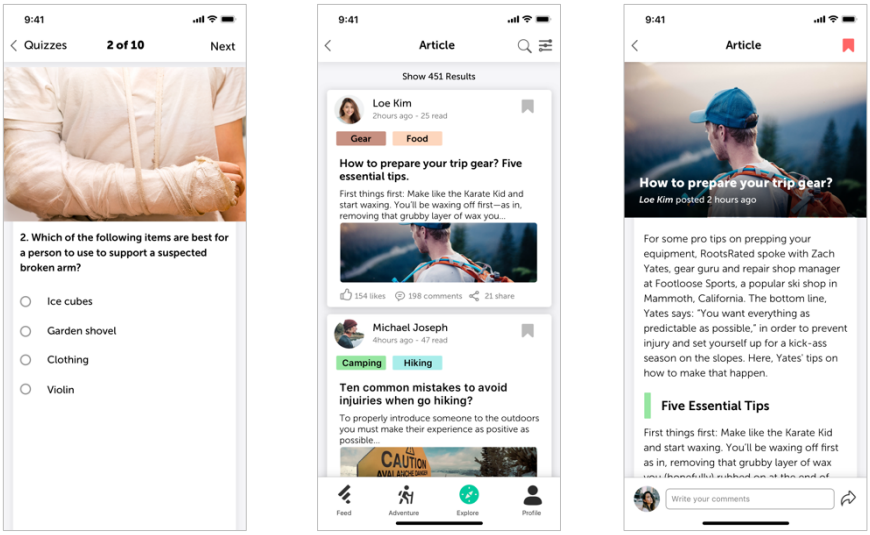


Figure 39-41. Other learning tools

Except AR educating feature, there are also a lot of other learning tools in this application, like quiz, articles, training videos, etc. Different layouts were applied to each tool to maximize benefit.

Evaluation

Usability testing

During the design process, several user tests were conducted for feedback and improvement, both design reviews from professors and user interviews helped me to create a better user experience. During the user testing, three main parts were asked. The first part was the understanding of main functions the workflow. The second part was the usability of design approaches (How AR features can help to reduce injuries). The third part was about the aesthetic and visual style of this project.

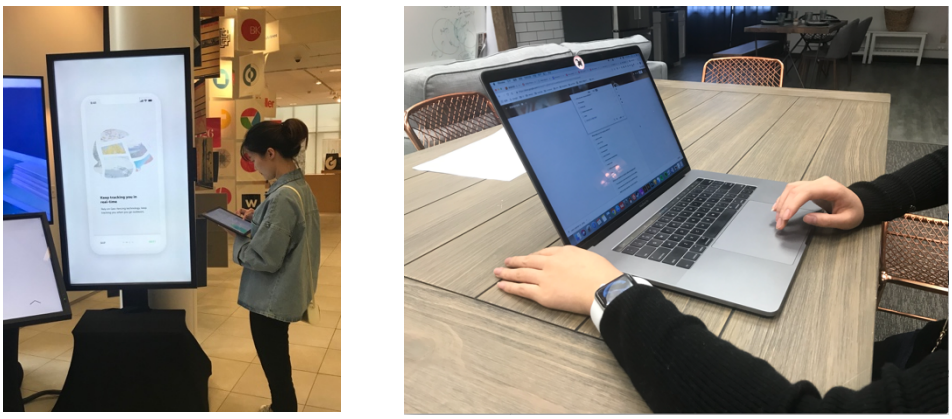


Figure 42-43. Usability testing

The overall user experience was positive, users can easily figure out the main purpose of TrailXplorer and they were excited about the AR feature. Some participants thought that the visual contrast on the homepage was not high enough to emphasize the quick entries. And some participants claimed that they expected more clear instructions in the AR pages. A lot of modification were applied based on user's feedback.

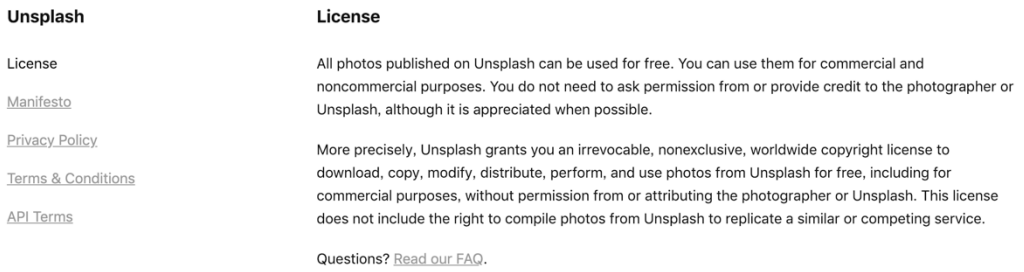
Conclusion

The overall purpose of this project was to reduce injuries from outdoor activities by promoting safety awareness and educating people through enhancing their outdoor activities skills. By introducing the emerging technology, AR can play an important role to support the user in real time. The biggest value of this project is to use technology to protect people from injury and improve their outdoor experiences in different scenario. For instance, to prevent an injury before the trip by using the AR feature to highlight the difficult levels, to guide and protect the user during the trip, AR gives the user real-time navigation and hazard warnings; Even the user encounters some unfortunate events, the technology can help that user to quickly identify the problem and provide solution.

For the future iterations, TrailXplorer is still limited by current technology, consider the poor network connection and the unpredictability of situations in the outdoors, it's challenging for users to use the AR features today. However, this experiment and design ideation is worth to try. Additionally, there are a lot of other design problems that need to be deliberated. For example, the users are growing up, their skills level are changing, and how to respond to the changing needs of the target audience needs to be continually addressed. The question becomes how to transform the application content to match the user's level, etc. With the development of technology, the author hopes this idea can become a powerful tool to support users in the future.

Sources for Imagery

For creating interfaces, images of profiles, personas, and multimedia examples are used. All these images are provided from Unsplash, which allows all photos can be used for free for any purpose.



Unsplash

License

Manifesto

Privacy Policy

Terms & Conditions

API Terms

License

All photos published on Unsplash can be used for free. You can use them for commercial and noncommercial purposes. You do not need to ask permission from or provide credit to the photographer or Unsplash, although it is appreciated when possible.

More precisely, Unsplash grants you an irrevocable, nonexclusive, worldwide copyright license to download, copy, modify, distribute, perform, and use photos from Unsplash for free, including for commercial purposes, without permission from or attributing the photographer or Unsplash. This license does not include the right to compile photos from Unsplash to replicate a similar or competing service.

Questions? Read our FAQ.

Figure 1

1. https://www.kisspng.com/png-product-design-user-experience-design-graphic-desi-6404560/download-png.html.

Figure 3

2. Chad Madden. Unsplash. https://unsplash.com/photos/qYXJhfp_wXo

Figure 4

3. Kristopher Roller, Unsplash. https://unsplash.com/photos/Uq6WlG18JDU

Figure 5

4. Sheshan, https://importanceofbeingvisual.com/2018/07/11/creating-visual-metaphors-with-digital-images-journeys-part-2/

6. Nathan Lindahl, Unsplash. https://unsplash.com/photos/RHdKKni84pM

Figure 13

7. Sead Dedic. Unsplash. https://unsplash.com/photos/Y3usWRH9Th4

Figure 14

8. Amir Saboury. Unsplash. https://unsplash.com/photos/1EhK52npZMo

9.Patrick Hendry, Unsplash. https://unsplash.com/photos/eDgUyGu93Yw

Figure 16

10. Almos Bechtold. Unsplash. https://unsplash.com/photos/d0ikvXIRAVA

11. Chris Holder. Unsplash. https://unsplash.com/photos/pyMNFCC1wqM

12. Clarisse Meyer. Unsplash. https://unsplash.com/photos/hbOZY0gppaY

Figure 40

13. Dolman Law Group. Unsplash. https://www.dolmanlaw.com/insurance-carriers-deal-minor-impact-soft-tissue-cases/

Reference

1. Jeffrey Heimgartner, “What is augmented reality and how can engineers and designers use it” posted on April13, 2016. https://www.engineering.com/IOT/ArticleID/11873/What-Is-Augmented-Reality-and-How-Can-Engineers-and-Designers-Use-It.aspx

2. Florian Niebling, Rita Griesser, Use Woessner, “ Using Augmented Reality and Interactive Simulations to Realize Hybrid Prototypes” published in 2008. https://link.springer.com/chapter/10.1007/978-3-540-89639-5_96#copyrightInformation

3. Vicki Parker, “What’s killing America’s hikers?” updated on February 26, 2017. https://skyaboveus.com/climbing-hiking/Whats-Killing-Americas-Hikers.

4. Stewart Green, “Statistics for climbing accidents, injuries and fatalities” updated February 19, 2017. https://www.thoughtco.com/climbing-accidents-statistics-756064

5. Jakub Bloksa, “Design guidelines for user interface for augmented reality” addressed in Spring, 2017. https://is.muni.cz/th/410072/fi_m/Thesis-final.pdf

6. Bobby Gill, “7 things to know about designing for virtual and augmented reality” updated on October 17, 2016. https://www.invisionapp.com/blog/designing-for-vr-ar/

7. Presented by the Coleman company, inc, and outdoor foundation. “Outdoor participation report”, released December 1, 2017. https://outdoorindustry.org/wp-content/uploads/2017/05/2017-Outdoor-Recreation-Participation-Report_FINAL.pdf

8. Presented by the Coleman company, inc, and outdoor foundation. “Outdoor recreation participation topline report”, released April 18, 2017. https://outdoorindustry.org/wp-content/uploads/2017/05/2017-Topline-Report_FINAL1.pdf

9. Presented by the Coleman company, inc, and outdoor foundation. “2016 American camper report”, released October 12, 2016. https://outdoorindustry.org/wp-content/uploads/2017/05/2016-Camper-Report_FINAL.pdf

10. Quovantis, “Why creating personas from user research results is important”, July 2, 2018, https://medium.muz.li/why-creating-personas-from-user-research-results-is-important-ba589a184d90

Appendix

User Research Questionnaire

Educational application for outdoor adventures

Hi, I am a graduate student majored in Visual Communication Design. This is a research questionnaire for my thesis project "Educational tool to prevent injuries from outdoor adventures". The survey helps me narrow down the project scope and identify the target audience. Thanks for your help!

Gender:

Short answer text

Age:

Short answer text

Occupation:

Short answer text

How many times do you attend outdoor activities every year?

Short answer text

What kinds of outdoor activities do you attend?

- [ ] Forest activities
- [ ] Beach & sea activities
- [ ] Mountains activities
- [ ] Fresh water activities
- [ ] Aero activities
- [ ] Desert activities
- [ ] Cultural & historical activities
- [ ] Land activities & Cycling
- [ ] Other

What are the purposes when you attend outdoor activities?

- [ ] Keep fit, do exercises
- [ ] Follow the trend
- [ ] Self - challenge
- [ ] Relax yourself, release pressure
- [ ] Photography
- [ ] Family trip
- [ ] Explore outside world
- [ ] Other

What keeps you from going outdoors?

- [ ] Lack of money
- [ ] Lack of time
- [ ] Lack of knowledge
- [ ] No equipment
- [ ] Lack of interest
- [ ] Inconvenience transportation
- [ ] Health issue
- [ ] Safety consideration
- [ ] Other

What's your opinion on outdoor skills and equipment?

- ○ The equipment is more important than skills and ability.
- ○ Good equipment can help with my insufficient skills.
- ○ Skills are really important. I do a lot of practice.
- ○ Skills and equipment are both important.

On a scale of 1 - 5, please rate your level of expertise in outdoor activities. (based on difficulty of activities, life saving skills, gear preparation)

	1	2	3	4	5	
Novice	○	○	○	○	○	Professional

Have you gotten injured while doing any outdoor activities? If so, what is the reason?

- [ ] Weathers/ environment issue
- [ ] Health issue
- [ ] Lack of food/water
- [ ] Poor judgement
- [ ] Lack of knowledge
- [ ] Lack of experience
- [ ] Equipement issue

Please mention any sources （a name) you use to get information about outdoor activities(e.g.: A YouTube channel, a website, blog, Instagram, mobile apps, etc)

Long answer text

Which functions interest you the most in an outdoor application?

- [ ] Life-saving skills/emergency rescue
- [ ] Equipment purchasing
- [ ] Equipment evaluation
- [ ] Route/activities recommendation
- [ ] Outdoor activities news
- [ ] Personal trail tracking/records
- [ ] Other

What are the most important things to you when you attend outdoor activities?

- [ ] The challenge
- [ ] Bonding with others
- [ ] Enough knowledge and developing skills
- [ ] Good equipment
- [ ] Personal safety

Do you have any suggestions for designing an educational tool that will help prevent injuries?

Long answer text

Dedication

Much gratitude to the following people and organizations for their support and guidance for this thesis:

Professor Mike Strobert

Professor Daniel Deluna

Professor Jason Arena

Professor Adam Smith

School of Design

Visual Communication Design Program

Rochester Institute of Technology